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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

M A I N I T E M S

INTER-AFRICAN PHYTOSANITARY COMMISSION

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INTER-AFRICAN PHYTOSANITARY COMMISSION

At the Conference of Colonial Experts held at Brussels on the 10, 11 and 12 December 1947 it was resolved that a Phyto-Sanitary Conference for Africa south of the Sahara should be held in London on 2 to 5 August 1948 at the invitation of the British Government. This Conference was duly held at which representatives of France, Belgium, Portugal, the Union of South Africa, Southern Rhodesia, and the British African Colonial Dependencies were represented.

Permanent Commission

The Conference recommended that the region to be covered by the proposed Phytosanitary Convention should include the whole of Africa south of the Sahara. It also considered the form the Convention should take and finally recommended that a Permanent Commission should be set up with headquarters in London, composed of representatives of the various governments with a Scientific Secretary. The Permanent Commission would receive copies of all phytosanitary legislation and coordinate measures for the control of pests and diseases of major importance. The Conference recommended the establishment of quarantine stations for each region near a research centre and, for certain particularly dangerous pests and diseases, intermediate quarantine outside Africa.

Permanent Centre of Information

To assist the Secretary a permanent centre of information based on the Commonwealth Institutes of Entomology and Mycology was to be set up to maintain a list of pests and diseases not recorded in Africa and lists of plants cultivated in the same country.

The Conference also stressed the dangers of aerial transport and the difficulties of diagnosing virus infections.

These recommendations of the 1948 Conference were embodied in a draft of the Proposed Phytosanitary Convention. This draft was reconsidered by a working party which met at the Colonial office in July, 1952, when the relationships of the Convention to the Commission for Technical Cooperation South of the Sahara (CCTA) and to the International Plant Protection Convention were defined. It was agreed that the Scientific Secretary should be responsible for securing close liaison with CCTA and that cooperation should be established with the World Reporting Service to be set up under the International Plant Protection Convention.

Convention Ratified

The Draft Convention was further considered at a meeting of government representatives in London on 31 October. Finally the Convention was signed and ratified by the governments of the United Kingdom, France, Belgium, Portugal, South Africa, and the Federation of Rhodesia and Nyasaland and presented to Parliament as a White Paper (Cmd. 9834) in August 1956.

In October 1956 M. Jean Risbec, formerly professor at the Institut d'Enseignement et de Recherches tropicales, Bondy, was appointed as Scientific Secretary to the Commission, which held its first meeting on 12 and 13 November in London under the chairmanship of M. P.M. Henry of CCTA.

The following delegates were present, Messrs. J. Berteaux and J. Fraselle (Belgium), J.A. Whellan and J.E.C. Coventry,(Federation of Rhodesia and Nyasaland), G. Bouriquet (France), A.S. Gann, J. Bourn, D.Rhind and L. Lord (United Kingdom), and Dr. N.S. du Toit (South Africa). Dr. W.J. Hall, Director, Commonwealth Institute of Entomology and Dr. J.C.F. Hopkins, Director, Commonwealth Mycological Institute, also attended.

The main business concluded at the meeting was the confirmation of the appointment of M. Risbec as Scientific Secretary, the arrangement of the finances of the Commission for 1957, and determination of the programme of work of the Scientific Secretary for that period.

PRESENTATION TO DR. WILTSHIRE

Some old friends of the C.M.I. assembled for afternoon tea at Ferry Lane on 20 December on the occasion of a presentation from plant pathologists and mycologists of the Commonwealth to Dr. S.P. Wiltshire to mark their appreciation of the many services he has rendered to science during his long directorship of the Institute.

Mr. Lambert of the Colonial Office and Chairman of the Executive Council of the Commonwealth Agricultural Bureaux made the presentation recounting some anecdotes of his association in various capacities with Dr. Wiltshire. He wished him happiness and good health for a well deserved rest. Mr. Lambert was introduced by Dr. Hopkins, who said that there had been a splendid response from the many mycologists and plant pathologists in all parts of the world who know Dr. Wiltshire personally, and he added that almost without exception each contributor had written to say that he or she would have been keenly disappointed had there not been an opportunity of contributing.

Dr. Wiltshire thanked Mr. Lambert and recounted some of the highlights and minor tragedies in the life of the Institute.

He has asked the editor of C.P. NEWS to send the following message to his well-wishers:

"I was deeply touched at receiving your very generous cheque from the hands of the Chairman of the Executive Council of the Commonwealth Agricultural Bureaux on December 20th last, following my retirement from the Directorship of the Commonwealth Mycological Institute. It has been a pleasure to me to serve the Commonwealth — and to know that what has been done has won your approval makes your gift doubly welcome. The Institute has grown with the work it has had to do and the increasing rapidity in the accumulation of knowledge of plant pathology and mycology throughout the world makes the task allotted to it correspondingly and increasingly important. To know that our work is appreciated greatly encourages the Staff, to whom I have been so much indebted for their most loyal service. It is a source of satisfaction to me that the new building has been completed and

occupied, that several projects I had in hand have matured, and that I leave the Institute I have had so much at heart in competent hands. I trust it will go from strength to strength. Will contributors kindly accept this acknowledgement of their most kind and much valued gift, which I propose spending on armchairs and a bookcase for my study, and the remainder on apparatus."

Among the guests was Dr. G. Taylor, the recently appointed Director of R.B.G., Kew.

THE IMPORTANT FUNCTIONS OF THE SPRAY NOZZLE

by R.P. Fraser, O.B.E., A.R.C.S.,
D.I.C., M.I.Chem.E., F.Inst.F., F.I.B.P.

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Imperial College of Science

Spraying is the operation of dispersing liquid particles through the atmosphere. The small part of the spraying machine causing disintegration, or atomization, has been called by different workers an atomizer, a sprayer, a spray nozzle, or just a nozzle. The spray nozzle or atomizer can be defined as a device to accelerate and disintegrate the liquid: first by the production of a liquid sheet from

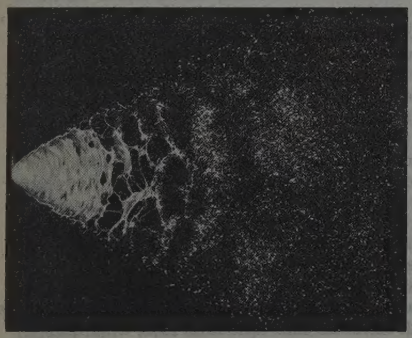

Fig. 1(a). High uniformity in size and dispersion of droplets in spray from an accurately manufactured nozzle. (Microsecond flash photo. 25 p.s.i. pressure.)

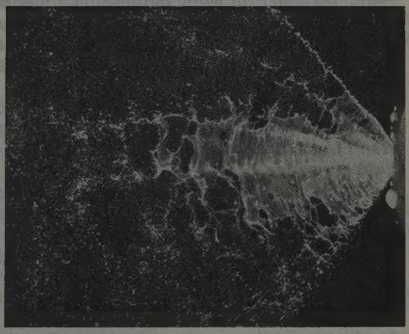

Fig. 1(b). Spray from nozzle damaged by "cleaning". Note uneven droplet size and dispersion. (Same conditions as fig. 1(a).)

which drops will be produced, and secondly by dispersing the resultant drops in a controlled pattern and direction. The full significance of these definitions is not always appreciated by manufacturers and users of spraying machines.

By the above definition a spray nozzle or atomizer must cause the liquid to be spread into a sheet from which threads and finally drops will be produced; which drops will have a velocity imparted to them, causing them to travel in a controlled direction so that they will be dispersed in a known pattern through the atmosphere.

The physical phenomena associated with spraying are very complex. This is brought about by:

(a) the large number of dimensional variables in the atomizer nozzle itself;

(b) The variation in physical properties of the liquid sprayed and in the hydraulics of flow;

(c) the changes of the ambient surroundings of the spray.

Assessment of the effect of these many variables is difficult and, so far, much of the research on sprays has given experimental evidence which is conflicting in many instances.

The spraying machine as a whole may cost tens or hundreds of pounds, whereas the most vital part, the spray nozzle or atomizer may only cost pence or shillings; yet the performance of this small part is paramount in achieving the desired result and more and more importance will, of necessity, be paid to it in agriculture in the future.

In the laboratory the flow inside and outside the nozzle can be analysed and related to the design. The pattern and uniformity of the spray can be determined. The manner of the liquid disintegration can be studied by photographing the movement of the liquid by high speed photography. A sample of the spray can be caught and a direct or indirect size analysis made. The uniformity of spray deposition can be analysed and the relative deposition volumes and transit lossed obtained. Such studies, however, can realize no useful gain in the field unless the atomizer, although it may only cost a few pence, be manufactured accurately, inspected precisely, and used intelligently without abuse.

Fig. 1, (a) and (b), are microsecond flash photographs of the disintegration of the liquid sheet produced by single hole fan spray nozzles using a water/oil emulsion. Both photographs are at 25 lbs./sq. in:

Fig. 1 (a) represents a well designed fan spray nozzle accurately produced;
Fig. 1 (b) shows the result of either bad design or abuse in use by so-called "cleaning" damaging the orifice.

The second photograph shows clearly that the spatial dispersion of the drops will be very uneven and the mean drop size seriously altered.

Some crop protection chemicals require maximum deposition, others require maximum time in aerial suspension, such as in space sprays. Spraying therefore falls under a number of heads each with different and characteristic atomizer requirements. In each application a number of nozzle sizes and designs is required to obtain the desired effect. There is no universal nozzle or atomizer for all purposes although, in many cases, pressure nozzles, particularly, can be designed with interchangeable parts to enable the user to satisfy a number of different spraying requirements.

In agriculture it would seem advisable to classify atomizers according to the drop sizes produced, but this has not so far been possible, although a mean drop size of one kind or another can be predicted for a particular nozzle, type, size, and fluid pressure.

Experience shows that the desirable drop size varies widely for different crop protection operations. Aerosols for space sprays require drop sizes from 1 to 30μ. Systemic and fungicidal sprays without air-conveying assistance require drops greater than 100μ, and contact sprays such as weed killers require drops of 100 to 300μ. Field experience appears to show that for good coverage with ground sprays without air conveyance 80 to 100 mass median diameter is desirable. With air assistance the MMD can be materially reduced to about 60μ, with a correspondingly great increase in specific surface. For long range spraying over distances greater than 6 ft., for small to medium volumes of, say, 0.1 to 15 galls/hr. per nozzle, air assistance must be used for conveying the particles, which will require to have drop sizes of about 40μ. For long-distance spraying in orchards, without air assistance, where spraying to run-off may be required, the desirable drop size will usually be above 150μ, and may be as great as 1,500μ to attain sufficient momentum to reach the comparatively great distance required. Such large drops may well be ejected at such a velocity, however, that it is above the critical size

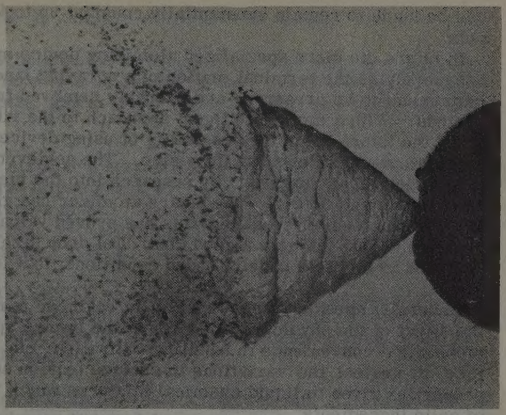

Fig. 2(c). Microsecond flash photo of distilled water spray at 20 p.s.i. showing contraction due to surface tension.

and the drops will become shattered by air action.

The use of high mass flow air machines delivering a high velocity jet, for conveying the sprayed particles at sufficient velocity to improve the dynamic catch of small drops on the plant's surface, means that much greater energy is available for producing liquid disintegration. Much of the disintegration occurs in such machines by air reaction on the particle after it has left the atomizing nozzle proper. In fact, it would be more accurate to consider the whole of the air jet or the blast nozzle from the machine as part of the atomizer.

The comparative mechanical simplicity of pressure atomizers has appealed to the agricultural engineer, but more recently those using centrifugal energy in the form of spinning discs or cups are being employed and, where small drops are required and air conveyance is used, twin-fluid or blast atomizers, using gaseous energy, are now becoming popular.

Although the efficiency of energy transfer in twin-fluid or blast atomizers is low it nevertheless represents the means of obtaining very small drops independent of the atomizer throughput or liquid pressure. This means that only one of a few atomizers need be used instead of a multiplicity of nozzles as has been common practice. With fewer nozzles to be considered it should be practicable in the future to make these more specialised, as has already been done in the liquid fuel industries. With more specialized twin-fluid atomizers the spray angle can be varied over a wide range by adjustment without changing component parts. The drop size, as expressed by the SMD or MMD, can be varied by changing the mass ratio of the second fluid (usually the air/liquid ratio). In many cases the drop size

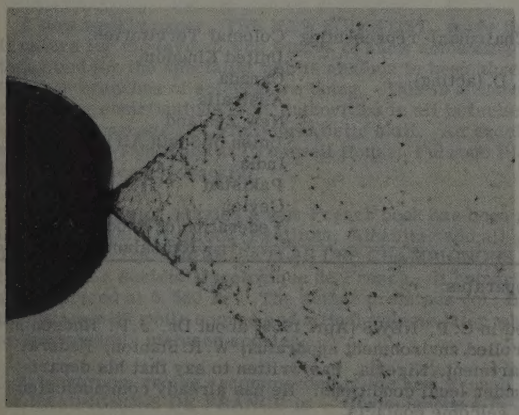

Fig. 2(d). Microsecond flash photo of tap water + spreader at 20 p.s.i. showing greater angle of dispersion and rapid disintegration. Compare with fig. 2(c)

can be made to remain substantially constant up to 40μ at different liquid throughputs.

In future the more specialized atomizing device must be considered by the user, not merely as the terminal orifice of a spraying lance or boom, but as a mechanical instrument to be preserved and probably removed from the machine during inactive periods. With a more intelligent approach to the vital importance of the atomizer itself the future holds the possibility of using devices which may give reasonably accurate variation of mean drop size. The achievement of such a device can only be brought about, however, by research into the mechanism of the break-up of the liquid sheet and thread. The rotary atomizer has given one means of obtaining a narrow spectrum of drops and this has proved valuable in the laboratory, but in practice it does not give a good control of drop size because it is almost certainly operated in the field under flooded conditions; that is to say, with an excess of liquid.

Generally speaking, the agricultural engineer is not very much concerned with the effect of the physical properties of the liquids sprayed, except as regards the mechanical convenience in handling, filtration, etc. It is very tempting, therefore, to neglect the variations in surface tension and density or any anomalous properties given to liquid chemical mixtures which may contain high proportions of solid ingredients.

Fig. 2, (c) and (d), show the considerable difference in the manner of breakdown of a conical sheet of liquid leaving a swirl spray nozzle using water, with and without a surface active agent. Both photographs are at 20 lbs./sq. in:

Fig. 2 (c) is of distilled water, where the contraction of the conical sheet due to surface tension is clearly evident.

Fig. 2 (d) is tap water containing 0.25 per cent. surface active agent, and the greater angle of dispersion and the more rapid disintegration are illustrated.

Similar great changes are observed in spraying slurries containing high percentages of solid materials such as wettable powders.

Clearly a systematic study is needed over a wide range of liquid properties to enable analysis to be made of the disintegration of complex mixtures of solids and liquids. In the future much may be done in controlling drop size by manipulating the physical properties of the spray mixture. The great need in future studies of drop size, however, is equipment to reduce the time and tedium involved in counting and sizing thousands of drops.

COMMONWEALTH AGRICULTURAL BUREAUX

Executive Council

The following comprise the Executive Council of the C.A.B. as at 1 January, 1956.

C.E. Lambert, C.M.G. (Chairman) representing	Colonial Territories
W.C. Tame	United Kingdom
J.G. Malloch, M.B.E., Ph.D. (acting)	Canada
A. Shavitsky	Australia
V. Armstrong, Ph.D.	New Zealand
E.D. Andrews	Union of South Africa
T. Swaminathan, I.C.S.	India
(Vacant)	Pakistan
V.M. Abeysekera (acting)	Ceylon
J.E.C. Coventry	Federation of Rhodesia and Nyasaland.

Controlled Environment Apparatus

Following the note published in C.P. NEWS [Apr. 1956] about Dr. J.P. Hudson's proposed directory of controlled environment apparatus, W.R. Stanton, Federal Agricultural Research Department, Nigeria, has written to say that his department is testing apparatus under local conditions. He has already communicated with Dr. Hudson and would welcome contacts.

FROM NEAR AND FAR

The I.C.I. have awarded six scholarships for sixth-form boys who have taken arts subjects at school but wish to take up a scientific career. They are tenable at I.C., London, King's, Newcastle, and at Cambridge, Oxford, and Liverpool Universities.

F.A.O. are offering five or six André Mayer fellowships, covering the whole field of agriculture, for a period of two years with a possible extension of six months. Pay is about 250 dollars a month. Particulars from F.A.O. National Committee for the United Kingdom, c/o Ministry of Agriculture, Fisheries, and Food, 10, Whitehall Place, London, S.W.1.

The OXFORD UNIVERSITY GAZETTE says that the university population has increased 50 per cent. since 1938, but the proportion of students of science today is much greater. In 1938, D. Phil. and B.Sc. students numbered respectively 67 and 78; in 1956 they were 218 and 802.

The importation of budwood of Dothidella-resistant Hevea into Malaya from South America has been so successful over the past few years that regular inspection of the growing clonal stock is no longer considered necessary and has been terminated.

The sigatoka disease (Mycosphaerella musicola) of bananas now threatens the entire crop in Ecuador and mist blowing from helicopters has been instituted as a measure of control. The results of the new method of treatment will be awaited with keen interest.

Publications of Interest

The BIBLIOGRAPHY OF SCIENTIFIC PUBLICATIONS OF SOUTH AND SOUTH-EAST ASIA with author index,' Vol. 1 (1955) and Vol. 2 (1956), is now being issued quarterly at Rs. 10 per volume.

The thirty third issue of the YEARBOOK OF THE UNIVERSITIES OF THE COMMONWEALTH has recently been published by the Association of Universities of the British Commonwealth, London, at the price of £3-3-0. It comprises lix + 1925 pages and has been slightly modified in contents from previous issues.

Also issued recently are the PROCEEDINGS OF THE FIRST CONFERENCE ON THE USES OF ANTIBIOTICS IN AGRICULTURE, Publication 397, Nat. Acad. Sci., xx + 278 pages from the Natural Resources Council, Washington 25, D.C., U.S.A. $2.50, and COMBINING FOR RESEARCH: THE WORK OF THE INDUSTRIAL RESEARCH ASSOCIATIONS IN THE GOVERNMENT SCHEME, 32 pages, 16 plates, D.S.I.R., London.

A new weekly paper, THE NEW SCIENTIST, made its appearance in November. It caters for the layman who wishes to know something of the scientific work of today and for the specialist who is anxious to keep abreast of what his colleagues in other branches of science are doing. This is a thoroughly readable periodical, containing contributions from authorities in all branches of science, written in everyday language and with journalistic skill. An excellent substitute for bridge at the club. Published at Cromwell House, Fulwood Place, High Holborn, London, W.C.1., price 1s. weekly.

For students of Agarics a new French book has been published dealing with Lactarius, Russula, Lepiota, Psalliota, Amanita, and all genera with coloured spores. This is vol. I of NOUVEL ATLAS DES CHAMPIGNONS by H. Romagnesi and published by La Société Mycologique de France. It comprises 96 pages and 76 plates and is priced at 5,550 Fr. The author promises vol. II early in 1957, describing the forms with white spores and a final volume later which will contain very rare or inadequately pictured species.

A mushroom recipe recommended in the new French Book PETITE FLORE DES CHAMPIGNONS DE FRANCE is — Champignons à la Revue de Mycologie: not, however appliquée.

PERSONAL NEWS

Visitors to C.M.I.

Among overseas visitors to the C.M.I. have been Dr. J. Meyer, Belgian Congo; K. Zan, Burma; S.K. Mukherji, and R.L. Munjal, India; Dr. A.G. Prendergast, Nigeria; Prof. A.E. Muskett, N. Ireland; and E.G. Simmons, U.S.A.

Appointments, Transfers, and Retirements

The Overseas Service of the Colonial Office announce the following appointments: P. Adames, assistant director of agriculture, Western Nigeria; D.R.N. Brown, deputy director of agriculture, Uganda; R. Comber, plant physiologist, Gambia; D.M. Dring, plant pathologist, Gold Coast; J.W.D. Goodban, director of agriculture, Sierra Leone; Dr. R.G. Hurd, plant physiologist, Gold Coast; G.E.O. Okiy, principal, School of Agriculture, Eastern Nigeria; R.F.A.L. Reed, assistant director of agriculture, Western Region, Nigeria; J. Rossiter, plant breeder, Northern Nigeria; W.V. Rose, assistant director of agriculture, Western Nigeria; D.G. Robertson, plant pathologist (probationer), Federation of Nigeria; A.L. Wharton, S.S.O., W.A.C.R.I.; S.G. Willmot, acting director, W.A.I.F.O.R.

C.A. Thorold is retiring from the Federal Department of Agricultural Research, Nigeria.

Dr. A.H. Bunting has accepted the Chair of agricultural botany at Reading University in succession to Prof. D.W. Goodall, who has been appointed director of the new Tobacco Research Institute of C.S.I.R.O. in North Queensland, Australia.

Dr. G. Watts Padwick has been appointed overseas director of Plant Protection Ltd.

Mr. C.E. Lambert, C.M.G., of the Colonial Office, has been elected chairman of the Executive Council of C.A.B.

Dr. P.W. Vorster has been appointed C.A.B. Liaison Officer for South Africa in place of M.S. Potgieter.

Mr. R.L. Munjal, keeper of the mycological herbarium at the Indian Agricultural Research Institute, New Delhi, is spending some months studying at C.M.I.

Prof. T.A. Bennet-Clark, professor of botany, King's College, London, and Dr. K.M. Smith of the Virus Research Unit, Cambridge, have been elected to the Council of the Royal Society.

Dr. William J. Robbins, director, New York Botanic Garden and professor of botany, Columbia University, has been elected a trustee of the Rockefeller Institution.

Awards

Prof. A.E. Muskett, head of the Department of Mycology and Plant Pathology, Queen's University, Belfast, and head of the Division of Plant Pathology of the Ministry of Agriculture of Northern Ireland has been awarded the O.B.E. in the New Year's Honours List.

Sir Alexander Fleck, chairman of I.C.I., has been awarded the Messel Medal for 1956 of the Society of Chemical Industry.

OBITUARY

The American plant pathologist, Prof. B.M. Duggar, well-known to the older generation of plant pathologists for his text book on the subject, died recently at his home in Connecticut, aged 84.

OVERSEAS NEWS

AUSTRALIAN NOTES

Olive Disease:

The fruit and leaf attacking fungus Cercospora cladosporioides was recorded for the first time in N.S.W. in 1952 causing minor damage near Sydney. During the past season it caused very considerable damage to olives of the variety Verdale in the Murrumbidgee Irrigation Area. The climate of this region is normally hot and dry over the summer months, but in 1956 unusual rains were experienced. It appears likely that the parasite must have existed undetected but widespread at a low level as a leaf parasite, since fruit infection in autumn 1956 was general and severe.

Septoria Spot of Citrus:

Septoria spot of citrus caused by Septoria depressa is in N.S.W. confined to the semi-arid south-western parts of the State where citrus is grown under irrigation. Infection occurs in the autumn during periods of high humidity or rain, but remains latent until winter or spring when changes in the rind brought about by frosts, cold winds, etc., induce the formation of lesions. This season unusual summer and autumn rains have resulted in the development of the disease in localities normally too dry for it to be a problem. A perfect stage (Mycosphaerella) has been found plentifully on fallen lemon leaves in an orchard at Tocumwal. This state had been developed in the laboratory some years ago by Dr. T.B. Kiely, but has not previously been found under field conditions.

Fruit Tree Mortality in New South Wales:

In the south-west of New South Wales is an area of flat country irrigated by water from the nearby Murrumbidgee River. At the beginning of 1956 this was a flourishing horticultural area with 3,700 acres of canning peaches, 1,700 acres of apricots, and 300 acres of dessert peaches and nectarines as well as many thousands of acres of other fruits including 6,800 acres of citrus and 5,800 acres of vines.

As a result of flood rains in March, April, May, June, and July, there has been catastrophic mortality in peaches, apricots, and citrus. The full extent of the damage will not be clear until about mid-summer, but it was evident by mid-October that at least 154,000 peach trees, 52,000 apricot trees, and 30,000 citrus trees will not survive. Losses in other parts of New South Wales, particularly on the central coast, have also been heavy. A preliminary state-wide survey in mid-October showed the evident losses at that time to be 184,000 peach trees, 54,000 apricot trees and 345,000 citrus trees. In addition, losses of stocks and worked trees in nurseries have been very heavy.

The losses in citrus have been mainly due to root rot caused by Phytophthora citrophthora [see C.P. NEWS, 2, 3, p. 41] but there was some evidence of salt toxicity on the Murrumbidgee Irrigation Areas. The peach and apricot losses in the waterlogged heavier soils in the central coast region were almost entirely due to root rot caused by Phytophthora cinnamomi. This fungus has been known to cause extensive mortality under waterlogged conditions, in peach and apricot orchards and in nurseries in the central coast since 1949. It is evident that some plum stocks are resistant to this fungus, for trees on plum stock have been observed surviving in many instances beside rows of dead trees on peach or apricot stock. It has also been demonstrated that P. cinnamomi is not lethal except in waterlogged soil. It is effectively controlled in the orchard by adequate under-drainage.

On the Murrumbidgee Irrigation Areas the precise cause of the mortality of peaches and apricots this year is not yet clear. Two species of Phytophthora have been isolated, but they have yet to be identified positively. Their pathogenicity has not yet been tested, but many circumstances and symptoms suggest that at lease one of them may be pathogenic. Other possible factors contributing to the mortality are salt toxicity and root asphyxiation. In those orchards where tile drains had been installed and were operating effectively there was no mortality.

Similarly, mortality in prunes or in other trees on plum stock was slight.

C.J. Magee

NEW ZEALAND NOTES

Visit of W. M. Cormack of Lethbridge, Canada: After attending the International Grasslands Congress at Palmerston North, Mr. Cormack visited the Mycology Laboratory at Crop Research and Lincoln College where he was able to give valuable advice on lucerne diseases. The visit was most opportune because the area under lucerne in New Zealand is now rapidly increasing. He later visited Plant Diseases Division, Auckland, and then left for Australia.

New Records of Plant Diseases in New Zealand: Mr. Thomson, of Mycology laboratory, Lincoln, has identified potato virus S in New Zealand's most widely grown variety, Aucklander Short Top. Although this virus has only recently been identified reports indicate that it is widespread in potato varieties in Europe and North America. Potato virus S was eliminated from Aucklander Short Top using a method similar to that used for eliminating virus Y (NATURE, 177, p. 709, 1956). Tissue cultures were established from etiolated potato sprouts and maintained in darkness at 30°C. for up to 110 days. During this period new growth was excised and regrown twice in succession under these conditions. Plantlets were finally kept in the light at room temperature and after recovery were transferred to soil in pots. A full account of the work is being prepared.

Miss J. M. Dingley, Plant Diseases Division, Auckland, has prepared these notes on new fungus diseases in New Zealand:

Apple fruits showing fly speck (Leptothyrium pomi) were collected from a cold store in Henderson, Auckland, in October, 1956. The superficial colonies were more than a centimetre in diameter. Pycnidia only were formed on the lesions.

Lettuce leaves on plants growing at the Plant Diseases Division, Auckland, were found to be infected with Septoria lactucae. The upper surfaces of the pale brown lesions were stippled with the brown coloured pycnidia. The disease appeared mostly on the outer leaves of the majority of the plants in the crop.

Maize cobs infected with a basal rot caused by Nigrospora oryzae were sent to the Plant Diseases Division from Gisbonne, Hawkes Bay, in May, 1956. The wet season probably made the presence of this fungus more noticeable.

Onion rust (Puccinia porri) was collected in South Canterbury in January, 1956, on chives (Allium sativum) and multiplying onions (A. fistulosum). The disease is uncommon in New Zealand, the only other record being on onions and shallots (A. ascalonicum) in Rotorua in January, 1949.

Leaves of Rhododendron spp. infected with Guignardia rhodorae were collected in New Plymouth in May, 1956. Pycnidia only were found on the characteristic reddish-brown lesions.

Cereal Yellow Dwarf Virus Seen in Australia by H.C. Smith: Cereal yellow dwarf virus appears to be a much more widespread and prevalent disease of cereals than was first thought, and new records are frequent since it was first described by Oswald & Houston (PHYTOPATHOLOGY, 42, p. 518, 1952) in California. Dr. Oswald in 1954 while on sabbatic leave in Holland showed cereal yellow dwarf to be present there. Later, I understand, Dr. J.T. Slykhuis found the disease widespread in the United Kingdom. In New Zealand it was first recognised in 1954 to be widespread on wheat, oats, and barley (C.P. NEWS, 1, 1, p. 11, 1955), and on a recent short visit to Australia the disease was seen to be very prevalent in wheat and oats in variety trials at the Department of Agriculture Demonstration Farm, Tamworth, New South Wales.

In New Zealand the disease has apparently been present for many years and the slowness with which trained plant pathologists are able to recognise even common

diseases makes one question the value of quarantine regulations (carried out by less highly skilled technicians) under our present state of knowledge of disease distribution.

Harvey C. Smith

NEWS FROM INDIA

Genetical Studies on Races 21 and 42 of Puccinia graminis tritici: Lately some new races of P.g. tritici have been reported from India. As to how these new races arise several hypotheses have been put forth. In this connection it was considered desirable to study the genetical constitution of some Indian physiologic races of this rust in the first instance. For this purpose, teleutospores of races 21 and 42 were raised during winter at Simla, for the teleutospores formed either in the plains during spring or in the hills during summer are not viable. Selfing studies of races 21 and 42 were made at Simla Sub-Station of I.A.R.I. on a susceptible local species of Berberis, namely, B. lycium, on which single cup-cultures were established. Race 21 yielded races 17 and 116, while race 42 yielded two new races. All the four races thus obtained are new to India.

Some new records of Fungi from India: At the Indian Agricultural Research Institute, a new genus of the Tuberculariaceae has been encountered. This is characterised by its bright orange-coloured sporodochia which have single-celled, hyaline spores with brush-like appendages at both ends.

Hill Bunt of Wheat: Due to late rains in the upper Simla Hills during September, 1955, the incidence of this disease was found to be quite high. Infection as high as 40 to 50 per cent. was observed in certain fields. The predominant species found in these areas is the smooth-spored bunt, Tilletia foetida.

Studies on Cyperus rust (Puccinia roumagnoliana): Though this rust had been recorded in literature as far back as 1903 and is reported from a number of countries its complete life history had not so far been worked out. Lately, Ramakrishnan and Sundaram have studied this rust at Coimbatore and established it to be heteroecious forming the aecidial stage on Ipomoea pestigridis and I. rumicifolium.

R.S. Vasudeva

NEWS FROM AFRICA

Federation of Rhodesia and Nyasaland

G.R. Bates reports that as a result of unprecedented weather in Southern Rhodesia, with continuous rain and overcast skies from 30 October until the end of December, potato late blight (Phytophthora infestans), which was practically unknown until 1952, has arrived six weeks earlier than ever before and has turned its attention to tomatoes (which until now were little affected) with devastating results.

The wet weather has also caused tobacco anthracnose (Colletotrichum tabacum), which only arrived two years ago, to become widespread. Severe outbreaks of wildfire have also occurred.

Changes of Address

The Library, Indian Council of Agricultural Research, Queen Victoria Road, New Delhi.

The Director of Agriculture, Box 30028, Nairobi, Kenya.

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IDENTIFYING MICRO-FUNGI

The major task in plant disease determination

Each year mycologists at the C. M. I. are asked to identify between 6,000 and 10,000 specimens of micro-fungi. This takes up a great deal of time and anything which can be done to speed up identification work is to be welcomed. One of the great drawbacks in the past has been the difficulty of matching collections of fungi, especially micro-fungi, against short and often inaccurate descriptions. One could never be quite certain that a name was being correctly applied to a given specimen and the lists of species compiled by mycologists and plant pathologists reflect a large number of misdeterminations. Many of the modern descriptions and figures are accurate and most helpful, but there are far too few of them.

The matching of slides made from fresh collections against slides made from type or authentic collections is undoubtedly the most accurate method of identifying micro-fungi. The fresh material can then be used as a standard for measuring further fresh collections. For many years, largely through the kindness and courtesy of Miss E. M. Wakefield and, later, Dr. R. W. G. Dennis, we have been able to match fresh collections in the first instance with authentic material in Herb. R. B. G. Kew. Many other Herbaria have, from time to time, sent us material for matching. Recently, after attending the first European Mycological Congress in Brussels, I went to Strasbourg and Paris to examine and photograph collections of micro-fungi. Through the kindness and courtesy of Professor Maresquelle and M. Theuret of the University of Strasbourg and Professor Heim, Madame Le Jal and Madame Nicot of Herb. Crypt. Mas. Paris I was enabled to examine over three hundred collections of Hyphomycetes in the course of a fortnight. One of the main purposes of the visit was to examine Wallroth's Herbarium in Strasbourg, which contains the types of most of his genera, many of them still in good condition after more than 100 years. It is hoped that when all the information obtained during the course of this visit has been assimilated and incorporated in the C. M. I. Herbarium that visits to other herbaria may be planned.

M. B. Ellis

SPREAD OF POD ROT OF CACAO

Monilia roreri a dangerous pathogen

The important cacao pod disease due to Monilia roreri has recently been reported from eastern Panama on Theobroma cacao (R. G. Orellana, F. A. O. PL. PROT. BULL. 4, p. 168, 1956). Hitherto it had only been known in Colombia, Ecuador, Peru, and Venezuela and it has been suggested that this further spread may have been due to the transport of infected cacao pods from the San Jeronimo area of north-west Colombia in Antioquia province. It may, however, have taken place in a different way.

The disease occurs on a wild species (T. gileri Cuatr.) as well as on cacao itself in north-west Colombia (R. E. D. Baker et al. REP. CACAO RES. TRINIDAD, 1953). It was found by the Anglo-Colombian expedition in primary forest on this wild host near Villa Arteaga (a rubber station), which is approximately half-way between San Jeronimo and the Colombian-Panamanian border, and specimens were sent to the Commonwealth Mycological Institute. I think it reasonable to suppose that T. gileri occurs also in similar country in eastern Panama, so that this host may well be responsible for the spread of the disease, which may have been present but undetected in Panama for a long time. The oldest record I have come across mentions what is almost certainly the same disease on cacao at Antioquia town in 1851, that is before the fungus had been described. This town lies some 20 miles nearer Panama than San Jeronimo.

Remarkably little is known of the life history of M. roreri and of the factors affecting its incidence, but there is little doubt that it may be serious. The report of this pathogen now in Panama draws fresh attention to the danger of its spread, not only to the cultivated cacao of Central America, but also into the West Indies. The need to investigate it fully grows more apparent.

Kuching, Sarawak Paul Holliday

E.W. MASON and S.F. ASHBY in the OLD HERBARIUM

Early days in the Imperial Mycological Institute Herbarium. E.W. Mason (in the foreground) and the late S. F. Ashby, one time Director, busy on the identification work which laid the foundation of the present C. M. I. (circa 1930).

"POOL" NEWS

Pepper research laboratory at Kuching, Sarawak

A survey by Robertson in 1953 (C.P. NEWS, 1, 2, 1955) confirmed the presence of a serious root disease of unknown origin of black pepper in Sarawak. As a result, a research unit was set up and a small plant pathology laboratory — the first in Sarawak — was completed by the end of 1955. It is situated at Batu Lintang, $2\frac{1}{2}$ miles south of Kuching, the capital.

Pepper pathology laboratory, Batu Lintang, Sarawak

(continued on p. 15)

COMMONWEALTH CULTURE COLLECTION

The new CATALOGUE of the Commonwealth Culture Collection, which is maintained at the C. M. I., is in preparation and is expected to appear this month. It is being photographed in its entirety at the C. M. I. and represents a venture into a new form of activity.

The collection has recently been completely overhauled and all redundant and deteriorated cultures discarded. The number at present in stock is a little over 2,000 but this is steadily being added to. In the last quarter 164 cultures were provided for industry and 259 for education and research; 21 were issued gratis.

Plant Disease Survey of Malta

Dr. B. E. J. Wheeler, who recently returned from his investigation of leaf spot of tobacco in Nyasaland caused by Alternaria longipes, will be going to Malta early in the New Year to make a preliminary survey of plant diseases for use by the Government of Malta in their reorganization of agricultural production.

Thirty Five Years Ago

"The Imperial Bureau of Mycology has undertaken the publication of a monthly abstracting journal, the Review of Applied Mycology, for the purpose of supplying, month by month, a summary of the work published in all countries on the diseases of plants and various other aspects of economic mycology.

The first number will be issued in January, 1922, and it is hoped to complete a volume of between four and five hundred pages annually. The subscription to the Review is 12s. per annum post free, payable in advance....."

Pepper pathology laboratory: Interior of main laboratory

The Laboratory

The building is of wood, one storied and placed 8 feet above the ground on termite-proofed concrete pillars, which are set on a concrete floor. The roof is of green tiles (Redland 5). Local belian or Bornean iron wood (Eusideroxylon zwageri) has been used for the floor and the main structural timber. The laboratory is 30 × 20 feet, and leading off it are preparation and culture rooms, both 10 × 8 feet. The height from floor to false "celotex" ceiling is 10 feet. "Naco" windows of adjustable glass louvres run almost the whole length of the laboratory on both sides above the two benches. Above them are open windows up to the ceiling. The culture room is ventilated and cooled by a ½ H.P. air-conditioner (Westinghouse A.W. 50). There is no gas supply, heating is by electricity, and fluorescent ceiling lights are fitted. A roofed verandah 6 feet wide runs round the building. The colour scheme of light green and grey with pale yellow doors helps to make this small laboratory lighter and pleasanter than many.

The Plant House

Plans have now been drawn up for a greenhouse and construction has now begun. The design is based on one described by Simmonds in 1951 at the Imperial College of Tropical Agriculture (TROP. AGRICULTURE, TRIN. 28, 70). Briefly, the plant house will have a concrete floor with a 3 feet brick wall. At one end is a potting shed, 12 × 20 feet, with expanded metal mesh from the top of the wall to the roof. Next to this is a propagating area, 12 × 32 feet, with concrete propagating bins and a self-draining floor. Beyond the propagating area, and communicating with it, is the greenhouse proper, 20 × 34 feet. The floor and concrete benches are self-draining. There are two benches, 3 × 4 feet, one down each side, and one, 6 × 25 feet, in the centre. The sides between wall and roof are enclosed by ½ inch, stout metal mesh. Belian wood provides the framework. The roof, except over the potting shed where there is no glass, is to be of alternate and equal strips of corrugated asbestos and glass fitted in belian frames, all joints being sealed with "tectum". The water supply will be arranged from a line running right down the centre of the building, which will also be fitted with electric light.

Colonial Pool of Plant Pathologists Paul Holliday
Kuching.

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